

## **Cassini/CIRS Observations of Saturn's "Storm Alley"**

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In the Voyager era storms on Saturn were observed predominantly in the northern hemisphere; however, in recent years storm activity has been confined to a narrow range of latitudes referred to as "storm alley" ( $\sim 40^\circ\text{S}$  planetographic latitude). Throughout Cassini's prime mission storms have been detected by two independent instruments: ISS through dayside images and RPWS using radio emissions from Saturn Electrostatic Discharges (SED's) (Dyudina et al. 2007). Analysis of these storms indicates that the cloud tops are in the 200 – 500mbar altitude range. During Saturn's Equinox, in August 2009, ISS imaged lightning on the night side in storm alley when ring-shine was at a minimum (Dyudina et al. 2010). This study indicates that lightning may have originated as deep as the water cloud.

Recently, Cassini/CIRS was targeted at storm alley while a storm, originally detected by amateurs, was ongoing (March 2010). Phosphine can be used as a tracer of vertical transport because it is a disequilibrium species that falls off with altitude in the upper troposphere. CIRS can measure temperature and phosphine abundance independently in the altitude range where these cloud tops occur. Early analysis of these data shows stronger phosphine absorption at storm longitudes. This is an indication that powerful updrafts were dredging material upward into the upper troposphere. The results of the analysis of the March 2010 CIRS observations of storm alley will be presented.

### **References:**

- Dyudina, U.A. et al., 2010. *Geophys. Res. Letters* **37**, L09205.  
Dyudina, U.A. et al., 2007. *Icarus* **190**, 545-555.